PB-221 403

AN ANALYSIS OF THE REGULATORY ASPECTS OF FUEL OIL SUPPLY (ABRIDGED REPORT)

FOSTER ASSOCIATES, INC.

PREPARED FOR
ENVIRONMENTAL PROTECTION AGENCY

JUNE 1973

Distributed By:

NTIS
National Technical Information Service
U. S. DEPARTMENT OF COMMERCE

APTD-1460

PB 221 403

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U S Department of Commerce
Springfield VA 22151

U.S. ENVIRONMENTAL PROTECTION AGENCY

Office of Air and Water Programs

Office of Air Quality Planning and Standards

Research Triangle Park, North Carolina 27711

BIBLIOGRAPHIC DATA SHEET	1. Report No. APTD-1460	2.	3. Recipient's Accession No.
4. Title and Subtitle An Analysis of the Regulatory Aspects of Fuel Oil Supply (Abridged Report)			5. Report Date June 1973 6.
7. Author(s) J. G. Tewksbury, H. W. Rockefeller, T. Snedeker			8. Performing Organization Rept. No. --
9. Performing Organization Name and Address Foster Associates, Inc. 1101 Seventeeth Street, N.W. Washington, D.C. 20036			10. Project/Task/Work Unit No. 11. Contract/Grant No. 68-02-0640
12. Sponsoring Organization Name and Address EPA, Office of Air Quality Planning and Standards Strategies and Air Standards Division Research Triangle Park, North Carolina 27711			13. Type of Report & Period Covered 14. Final Report
15. Supplementary Notes			

16. Abstracts

A study was conducted to review the current regulatory picture affecting the supply and distribution of natural gas and low sulfur fuel oil, to analyze possible changes in this regulatory picture, and to appraise alternate regulatory strategies which could bring about increased supplies of these clean-burning fuels. The results of the study are contained in two separate reports, one report for natural gas and the other for fuel oil. Also, abridged copies of the two comprehensive reports are provided.

17. Key Words and Document Analysis. 17a. Descriptors

Government
Law

17b. Identifiers/Open-Ended Terms

Air pollution
Fuel Oil

17c. COSATI Field/Group 5D

18. Availability Statement	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 56
Unlimited	20. Security Class (This Page UNCLASSIFIED	22. Price

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(ABRIDGED REPORT)

by

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Washington, D. C. 20036

Contract No. 68-02-0640

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Prepared for

ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Water Programs
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

March 1973

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Publication No. APTD-1460

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ABRIDGED REPORT

Foster Associates has undertaken a study for the Environmental Protection Agency to review the current regulatory picture affecting the supply and distribution of natural gas and low sulfur fuel oil, to analyze possible changes in this regulatory picture, and to appraise alternate regulatory strategies which could bring about increased supplies of these clean-burning fuels.

This abridged report deals only with the regulatory situation pertaining to the supply of low sulfur fuel oil.

I. CURRENT REGULATORY PICTURE AFFECTING OIL SUPPLY [1/]

Compared with the regulation of natural gas which thus far has been concentrated in relatively few governmental bodies, the regulation of oil involves a very large number of departments, agencies, councils and commissions -- federal, state and local. In part this diffusion of regulatory authority results from the control of oil and oil product imports under the Mandatory Oil Import Program. Because of foreign policy and other ramifications of MOIP, many governmental organizations have come to play a role in regulating or influencing one or more aspects of oil supply. Also, the critical importance of oil to the nation's economy and security has undoubtedly contributed to the proliferation of agencies involved.

A. Background Information

Before getting into the regulatory aspects of low sulfur fuel oil supply, some background information may be helpful to readers who are not familiar with the oil industry.

Oil is discovered in the ground by drilling wells, then additional wells are generally drilled to develop the discovery. Generally, gas is discovered with oil, and is produced with it. Or, gas may be discovered instead of oil. The "crude oil" from the wells moves to refineries for conversion into finished products and finally moves to the customer through gasoline service stations, etc. The movement of petroleum and its products is by pipeline, tanker, barge, and/or truck.

1/ The contents of this report are current as of January 1973.

The major segments of the industry are, thus, exploration, production, refining, and marketing, and these are linked together by transportation.

In its details, the oil industry has become very complex indeed. Its great size -- each man, woman, and child in the United States consumes an average of more than three gallons per day of petroleum products -- and its vital contribution to practically every segment of all developed economies has very much entangled the industry in both domestic and international politics.

The United States for many years was totally or nearly self-sufficient in oil. However, in the late 1950's, cheap foreign oil became available in almost unlimited quantities (compared to relatively much lower consumption at the time), and in 1959 the Mandatory Oil Import Program (MOIP) was established to preserve the domestic industry in the interest of national security. This program is discussed in depth later in this study.

We are now, as a nation, however, in the situation where domestic production of oil has peaked out -- we have no surplus capacity, and aside from the North Slope of Alaska, no major new source of conventional oil is in sight. Domestic demand is, nevertheless, continuing its inexorable rise, so our foreign dependence is skyrocketing. By 1975, we are likely to be about 50%[1/] dependent on foreign petroleums, and over 60%[1/] by 1980, barring massive new action to change this trend. It is true that the U.S. does have options in the form of supplemental ("synthetic") oil from shale

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1/ National Petroleum Council "U.S. Energy Outlook" December 1972, page 262, Case IV, with 1980 adjusted slightly by Foster Associates.

or coal, but, again, barring massive new programs they will not contribute much by 1980.

There are currently two problems relating to oil in domestic refining. One is an actual shortage of physical domestic capacity, which will not really be upon us for perhaps a year or two, and the other is lack of utilization of capacity already in place. The product supply problem was felt this winter in distillate, with a very tight supply situation and some actual shortfalls in meeting needs. The reasons for lack of utilization of available domestic capacity are several, one of which is a temporary shortage of crude oil particularly for inland refineries.

Crude oil as it comes from the well generally contains a wide range of components ranging from those that are gaseous at ordinary conditions to black solids. Ideally, crude oil is nearly pure hydrocarbon. However, most crude oil also contains impurities that must be partly or totally removed before use. Particularly important is sulfur, which if not removed will pollute the atmosphere when the oil is finally burned. Some crudes, such as much of Venezuelan oil, have high metals content, which makes sulfur removal much more difficult. Typically, crude oils contain nitrogen and other chemically combined impurities as well as sulfur. Also, crude oils generally are physically contaminated with water, salt, and sediment which must be removed in refining. Crude oil from different areas varies widely in composition and impurities content.

Crude oil, its components, and its products are generally classified according to their range of boiling temperature. Products such as gasoline, with lower boiling ranges are generally described as "light,"

while high boiling range materials such as residual fuel oil are referred to as "heavy." Light products are "clean," a residual oil, where the term residual means that it has not been distilled, is generally "dirty." Heavy products are generally more viscous than light, and may be solid at ordinary conditions.

The term "fuel oil" generally includes both "distillate" and "residual" fuel oils. Distillate, as the term is commonly used, is a clean, distilled oil that is heavier than gasoline. It is also called No. 2 oil, and generally includes both home heating oil and diesel fuel. Distillates are typically free flowing liquids except in extreme cold conditions. Residual fuel oil, which is often called No. 6 oil, contains undistilled "bottoms," and is generally a heavy, viscous, dirty product that ordinarily has to be heated to be used. Residual fuel oil is used for such things as electric power generation, large industrial boilers, ships bunkers, etc. The sulfur content of distillate is generally quite low. If it is not, it is relatively simple to process it to a low sulfur content. On the other hand, sulfur and metals in crude oil tend to concentrate in residual fuel. Therefore, a high sulfur crude oil will generally yield an even higher sulfur residual fuel oil unless a special desulfurizing step is added to refining. And, metals also concentrate in residual fuel, so a high metals, high-sulfur crude oil will be particularly costly to refine into low sulfur residual fuel oil because metals interfer with the desulfurization step.

Distillate is generally considered a premium product vs. residual oil -- distillate can often be used in place of residual but the reverse

is not the case. The term "gas-oil" generally refers to a refinery intermediate -- a semi-refined product that is heavier than gasoline.

The amount of any product that can be made from a given crude oil depends on refining facilities available. The relative value of the products will determine the actual product mix at a refinery. Generally, the more sophisticated refineries typical of the United States versus the rest of the world offer more flexibility in product mix. However, there is not total flexibility in product mix -- usually crude oil contains light (more volatile) components not suitable for fuel oil but usable for gasoline or other products. Therefore, most refineries have to make some other products besides fuel oil. There is generally not a lot of flexibility in the amount of distillate than can be made in a refinery, even with substantial changes in processing. On the other hand, residual fuel oil capability is more flexible, and processing can be varied to vary residual yield over a wide range. This is in large part because residual specifications are less stringent, and if one wants to put more valuable components into residual fuel it can be done within broad limits. In fact, with some modifications of storage and facilities, it is possible to burn whole crude oil in installations designed for residual fuel oil, and this is practiced in some parts of the world, especially Japan.

The U.S. oil industry consists of the following major segments:

1. The large international oil companies.
2. The large domestic oil companies.
3. Independent producers.
4. Independent refiners.
5. Independent distributors and marketers.

The first two groups together account for most of the domestic refining, marketing, and transportation operations in the U.S. and account for the majority of producing. Independent producers sell about one-third of the oil produced in the U.S. Domestic gasoline marketing is dominated by the large companies in the sense that they own most of the gasoline stations and use their brand names. The degree of integration (proportion of crude production owned by refiners) varies for the large companies, but most are substantially integrated.

The oil industry is also characterized by massive investment requirements in all phases of the business. It is also an industry of long lead times -- the time between the initiation of an exploration program and the first oil coming to market is generally in the two to five year range, and for engineering efficiency reasons, it generally takes in the range of 10 to 25 years or even longer to produce all the oil in a given field. The lead times for building refineries, pipelines and tankers are generally measured in the one to five year range, depending mainly on the size of the project. The consequence is that it is not easy to change direction quickly in this business. We are now realizing the consequences of past actions, and we will in the rest of this decade and beyond reap the consequences of action or inaction now.

Federal and local government have an unusually large influence on the oil industry. The federal government, among other things, regulates oil imports through MOIP, gives special tax treatment to oil producers (depletion allowance and intangible writeoff), regulates interstate transportation of oil, and controls leasing federal property. State governments,

particularly in Texas and Louisiana, influence oil production through conservation and "market demand pro-rationing" laws. The latter has been a subject of much controversy in the past, but has now become academic because these states are operating at essentially 100% of productive capacity.

B. State and Local Regulation

The supply of oil is affected by three types of state or local control: conservation regulation, leasing of lands, and local ordinances regarding land zoning and building permits. In general, neither state conservation controls nor state leasing practices are deemed at this time to present any material barrier to the development of supply. However, the extent to which public opposition in coastal states may be able to block leasing, drilling and construction of deepwater terminals or refineries on environmental grounds will have an obvious effect on the future development of supply.

Virtually all producing states exercise a variety of conservation regulations aimed primarily at preventing physical waste of oil and gas. Another purpose is to protect correlative rights[1/] of property owners. The regulations relate, among other things, to well completion techniques and equipment; spacing of wells; pooling of tracts; unitization of reservoirs and portions thereof; limitation of production to reasonable market

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1/ Correlative rights are the rights of each oil property owner to his fair share of the oil and gas under his property. A single oil reservoir may have many owners, and regulations are designed to keep one owner from withdrawing oil which belongs to others.

demand; allocation of allowable production to pools and among wells in a pool; secondary recovery operations; and protection against land and water pollution as a result of oil and gas drilling and production.

State regulation of production through market demand prorationing developed during the 1930's in response to excessive output and sharp price drops following huge oil discoveries, particularly in Texas and Oklahoma. In states where producing capacity exceeded market demand, prorationing of production based on market demand clearly put a brake on the level of domestic supply output for many years. However, prorationing is not a factor in the current fuel shortage because excess productive capacity no longer exists. In the two principal producing states, Texas and Louisiana, monthly allowable production of oil has been authorized at maximum efficient producing rates[1/] of the wells for several months (with the exception of a few fields held to lower rates because of reservoir problems, or other reasons). Three other states (Oklahoma, Kansas and New Mexico) have been producing essentially at 100% -- or more -- of maximum efficient well rates for two or more years.

Producing states all have authority to lease state lands. In general, leases are awarded at public auction to parties offering the highest cash bonus, and provide for a fixed royalty to the state on all oil and gas produced. In general, a basic objective of the states in the past has been to lease lands in order to maximize revenues. In some states,

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1/ The maximum rate at which oil can be produced without excessive decline or loss of reservoir energy. If rate is exceeded, lower ultimate recovery of oil will result.

royalties from production on state lands are a significant source of revenue. Except perhaps for local situations, there has been little pressure to restrict leasing and development of potential oil and gas lands. Recently, however, environmental considerations -- the threat of oil spills in particular -- have caused various state legislatures and/or regulatory bodies to seek to halt or ban leasing and drilling activities on certain offshore lands. However, these problems have been minimal in Texas and Louisiana, the two dominant offshore producing states.

In California, for example, there has been no further leasing and almost no drilling of state offshore lands since the major oil spill in the Santa Barbara Channel in early 1969.

On the East Coast, similar pressures are building up against offshore leasing and drilling. For example, several bills were introduced in the New York State Legislature in 1972 to ban oil and gas well drilling in the Atlantic Ocean off Long Island and/or adopt other measures aimed at environmental protection of offshore lands. Two of these bills were passed but subsequently vetoed by Governor Nelson Rockefeller. One bill would have prohibited the leasing of any offshore lands for oil or gas extraction within three miles of the New York coastline (or such other boundary as may be ultimately determined to be subject to state jurisdiction). In vetoing this bill, Governor Rockefeller stated that the nation's growing energy needs may make it desirable to permit drilling off New York shores at some future time, and that the State Commissioner of Environmental Conservation has adequate powers to insure that any such drilling will be consistent with the need to protect the state's marine sanctuaries and recreational areas.

Finally, state and local officials have the right to impose restrictions on the use of private property through local zoning ordinances. During the past few years, there have been increasing instances where local officials have yielded to environmental protests and refused the necessary zoning and/or building permits for energy producing facilities. To illustrate, the State of Delaware in 1971 passed a law prohibiting the building of any new refinery or superport within that state.

C. Federal Regulation

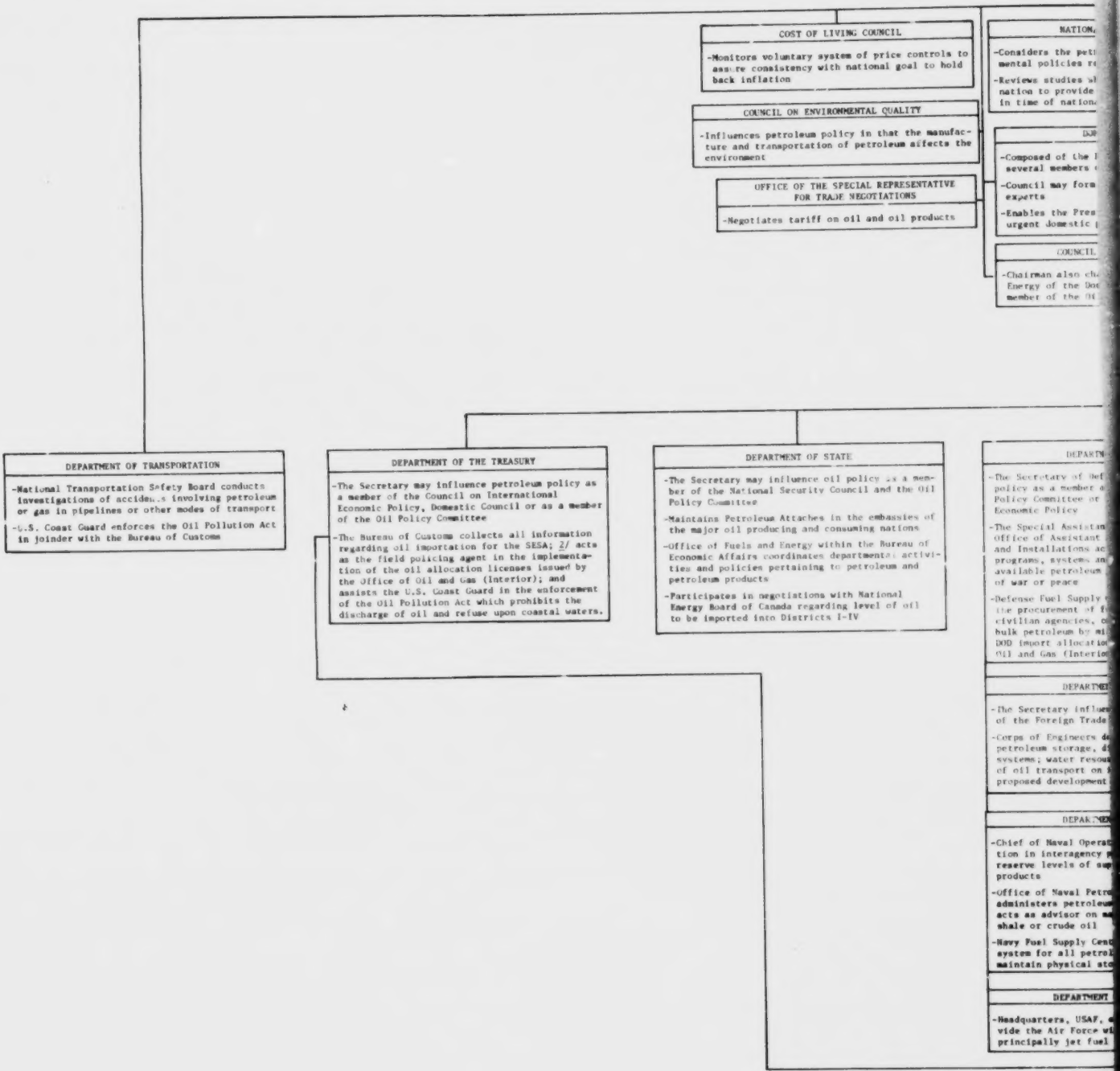
On the federal level, oil supply is influenced by several councils or other bodies within the Executive Office of the President, by at least seven Executive Departments and by a number of independent agencies. The more important of the various organizations, together with a rough outline of the organizational structure, are depicted on the chart following this page.

Executive Office of the President

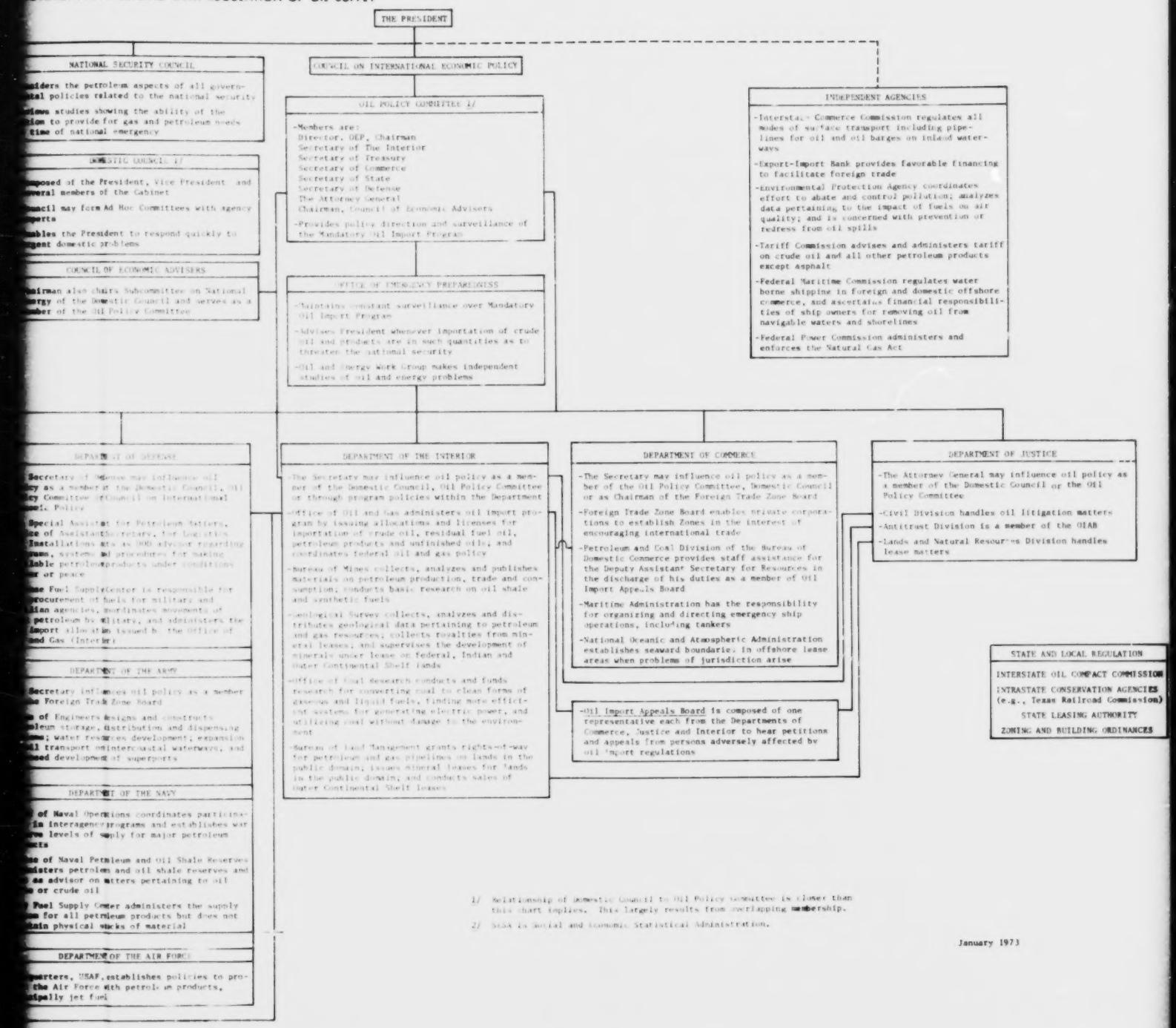
Below the President and his immediate White House assistants, the Oil Policy Committee is the principal oil policy formulation body in the Federal Government. Established in 1970 as a result of a recommendation by the Cabinet Task Force on Oil Import Control, the Oil Policy Committee includes the Director of the Office of Emergency Preparedness (who serves as Chairman),[1/] the Secretaries of Interior, Defense, State, Commerce and

1/ Under a Reorganization Plan submitted by the President to Congress on January 26, 1973, the Office of Emergency Preparedness would be abolished and its functions transferred to other agencies. The Deputy Secretary of the Treasury would replace the Director of OEP as Chairman of the Oil Policy Committee.

FEDERAL GOVERNMENT ORGANIZATIO


COST OF LIVING COUNCIL
-Monitors voluntary system of price controls to assure consistency with national goal to hold back inflation
COUNCIL ON ENVIRONMENTAL QUALITY
-Influences petroleum policy in that the manufacture and transportation of petroleum affects the environment
OFFICE OF THE SPECIAL REPRESENTATIVE FOR TRADE NEGOTIATIONS
-Negotiates tariff on oil and oil products
DEPARTMENT OF TRANSPORTATION
-National Transportation Safety Board conducts investigations of accidents involving petroleum or gas in pipelines or other modes of transport
-U.S. Coast Guard enforces the Oil Pollution Act in joinder with the Bureau of Customs
DEPARTMENT OF THE TREASURY
-The Secretary may influence petroleum policy as a member of the Council on International Economic Policy, Domestic Council or as a member of the Oil Policy Committee
-The Bureau of Customs collects all information regarding oil importation for the SESA; 2/ acts as the field policing agent in the implementation of the oil allocation licenses issued by the Office of Oil and Gas (Interior); and assists the U.S. Coast Guard in the enforcement of the Oil Pollution Act which prohibits the discharge of oil and refuse upon coastal waters.
DEPARTMENT OF STATE
-The Secretary may influence oil policy as a member of the National Security Council and the Oil Policy Committee
-Maintains Petroleum Attaches in the embassies of the major oil producing and consuming nations
-Office of Fuels and Energy within the Bureau of Economic Affairs coordinates departmental activities and policies pertaining to petroleum and petroleum products
-Participates in negotiations with National Energy Board of Canada regarding level of oil to be imported into Districts I-IV

GANIZATIONS DEALING WITH REGULATION OF OIL SUPPLY


THE PRESIDENT
NATIONAL SECURITY COUNCIL
iders the petroleum aspects of all governtal policies related to the national security
iews studies showing the ability of the ion to provide for gas and petroleum needs time of national emergency
MESTIC COUNCIL 1/
posed of the President, Vice President and veral members of the Cabinet
uncil may form Ad Hoc Committees with agency ports
ables the President to respond quickly to gent domestic problems
COUNCIL OF ECONOMIC ADVISERS
hairman also chairs Subcommittee on National ergy of the Domestic Council and serves as a mber of the Oil Policy Committee
COUNCIL ON INTERNATIONAL ECONOMIC POLICY
OIL POLICY COMMITTEE 1/
-Members are:
Director, OEP, Chairman
Secretary of The Interior
Secretary of Treasury
Secretary of Commerce
Secretary of State
Secretary of Defense
The Attorney General
Chairman, Council of Economic Advisers
-Provides policy direction and surveillance of the Mandatory Oil Import Program
OFFICE OF EMERGENCY PREPAREDNESS
-Maintains constant surveillance over Mandatory Oil Import Program
-Advises President whenever importation of crude oil and products are in such quantities as to threaten the national security
-Oil and Energy Work Group makes independent studies of oil and energy problems
INDEPENDENT AGENCIES
-Interstate Commerce Commission regulates all modes of surface transport including pipelines for oil and oil barges on inland waterways
-Export-Import Bank provides favorable financing to facilitate foreign trade
-Environmental Protection Agency coordinates effort to abate and control pollution; analyzes data pertaining to the impact of fuels on air quality; and is concerned with prevention or redress from oil spills
-Tariff Commission advises and administers tariff on crude oil and all other petroleum products except asphalt
-Federal Maritime Commission regulates water borne shipping in foreign and domestic offshore commerce, and ascertains financial responsibilities of ship owners for removing oil from navigable waters and shorelines
-Federal Power Commission administers and enforces the Natural Gas Act
DEPARTMENT OF DEFENSE
Secretary of Defense may influence oil cy as a member of the Domestic Council, Oil cy Committee of Council on International mic Policy
Special Assistant for Petroleum Matters, ce of Assistant Secretary, for Logistics Installations acts as DOD advisor regarding rams, systems and procedures for making ilable petroleum products under conditions r or peace
se Fuel Supply Center is responsible for procurement of fuels for military and ilian agencies, coordinates movements of petroleum by military, and administers the import allocation issued by the Office of and Gas (Interior)
DEPARTMENT OF THE ARMY
Secretary influences oil policy as a member he Foreign Trade Zone Board
of Engineers designs and constructs leum storage, distribution and dispensing ms; water resources development; expansion l transport on inter-coastal waterways, and ed development of superports
DEPARTMENT OF THE NAVY
of Naval Operations coordinates participa- in interagency programs and establishes war ve levels of supply for major petroleum cts
e of Naval Petroleum and Oil Shale Reserves isters petroleum and oil shale reserves and as advisor on matters pertaining to oil or crude oil
Fuel Supply Center administers the supply m for all petroleum products but does not ain physical stocks of material
DEPARTMENT OF THE AIR FORCE
quarters, USAF, establishes policies to pro- the Air Force with petroleum products, cipally jet fuel
DEPARTMENT OF THE INTERIOR
The Secretary may influence oil policy as a member of the Domestic Council, Oil Policy Committee or through program policies within the Department
-Office of Oil and Gas administers oil import program by issuing allocations and licenses for importation of crude oil, residual fuel oil, petroleum products and unfinished oils, and coordinates federal oil and gas policy
-Bureau of Mines collects, analyzes and publishes materials on petroleum production, trade and consumption; conducts basic research on oil shale and synthetic fuels
-Geological Survey collects, analyzes and distributes geological data pertaining to petroleum and gas resources; collects royalties from mineral leases; and supervises the development of minerals under lease on federal, Indian and Outer Continental Shelf lands
-Office of Coal Research conducts and funds research for converting coal to clean forms of gaseous and liquid fuels, finding more efficient systems for generating electric power, and utilizing coal without damage to the environment
-Bureau of Land Management grants rights-of-way for petroleum and gas pipelines on lands in the public domain; issues mineral leases for lands in the public domain; and conducts sales of Outer Continental Shelf leases
DEPARTMENT OF COMMERCE
-The Secretary may influence oil policy as a member of the Oil Policy Committee, Domestic Council or as Chairman of the Foreign Trade Zone Board
-Foreign Trade Zone Board enables private corporations to establish Zones in the interest of encouraging international trade
-Petroleum and Coal Division of the Bureau of Domestic Commerce provides staff assistance for the Deputy Assistant Secretary for Resources in the discharge of his duties as a member of Oil Import Appeals Board
-Maritime Administration has the responsibility for organizing and directing emergency ship operations, including tankers
-National Oceanic and Atmospheric Administration establishes seaward boundaries in offshore lease areas when problems of jurisdiction arise
-Oil Import Appeals Board is composed of one representative each from the Departments of Commerce, Justice and Interior to hear petitions and appeals from persons adversely affected by oil import regulations
DEPARTMENT OF JUSTICE
-The Attorney General may influence oil policy as a member of the Domestic Council or the Oil Policy Committee
-Civil Division handles oil litigation matters
-Antitrust Division is a member of the OIAB
-Lands and Natural Resources Division handles lease matters
STATE AND LOCAL REGULATION
INTERSTATE OIL COMPACT COMMISSION
INTRASTATE CONSERVATION AGENCIES (e.g., Texas Railroad Commission)
STATE LEASING AUTHORITY
ZONING AND BUILDING ORDINANCES

1/ Relationship of Domestic Council to Oil Policy Committee is closer than this chart implies. This largely results from overlapping membership.

2/ SSSA is Social and Economic Statistical Administration.

January 1973

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Treasury, the Attorney General, and the Chairman of the Council of Economic Advisers. In addition, observers normally sit in the Committee from the White House and the Office of Management and Budget.

Prior to the creation of the Oil Policy Committee, the OEP played the major role in oil policy and was responsible for the policy direction of the Mandatory Oil Import Program. Under the Presidential Proclamation setting up the MOIP in 1959, the Director of OEP was directed to maintain a constant surveillance of imports of petroleum and its primary derivatives in respect to national security and to inform the President of any circumstance which, in the Director's opinion, might indicate the need for further Presidential action. Such surveillance was to include a determination of whether any increases in the prices of crude oil or its products occurring thereafter were necessary to accomplish the national security objectives of the Proclamation.

The Director of OEP is also Chairman of the Joint Board on Fuel Supply and Fuel Transport, the purpose of which is to identify emergency problems in fuel supply and fuel transport and to coordinate prompt and appropriate remedial action by federal agencies. Other members of this Board include the Secretaries of Interior and Commerce, and the Chairmen of the Council of Economic Advisers, Council of Environmental Quality, Interstate Commerce Committee, and Federal Power Commission. OEP has established Field Boards to help implement the decisions of the Joint Board, and to assist with fuel and energy problems at the local level.

Other organizations within the Executive Office of the President affecting oil supply include, among others:

- National Security Council
- Domestic Council
- Council of Economic Advisers
- Council of Environmental Quality
- Cost of Living Council
- Office of Management and Budget
- Office of the Special Representative for Trade Negotiations

The newest of the above organizations -- and one with substantial impact on the supplies of low sulfur fuel oil supply which will be forthcoming at least over the short term -- is the Cost of Living Council. Established by Executive Order 11615, issued August 15, 1971, the COLC was charged with primary responsibility for administering the 90-day price-wage freeze program imposed at that time.

Following the 90-day freeze and the initiation of Phase II of the Economic Stabilization Program (which imposed mandatory price and wage controls on most sectors of the economy), the COLC continued to be responsible for overall policy guidance, while formulation and implementation of specific criteria to govern price adjustments in particular industries was delegated to the Price Commission. However, the Price Commission was abolished on January 11, 1973 by Executive Order 11695 which terminated the mandatory price-wage controls in effect in Phase II for all but a few sectors of the economy and substituted instead a "self-administering" system of price restraints based on voluntary compliance. The COLC was directed to oversee this program and given authority to establish mandatory standards if considered necessary to assure that future actions in a particular industry are

consistent with the national goal of reducing the rate of inflation to 2.5% or less in 1973.

Policies adopted by the COLC[1/] in the months ahead will be critically important to fuel oil supply. This stems from the fact that, during Phase II, the price of No. 2 fuel oil was restricted to a fairly low level relative to gasoline and other refinery products. Accordingly, refineries were reluctant to increase their distillate yields without an increase in the price of No. 2 fuel oil. This is considered to be a major factor contributing to the development of No. 2 fuel oil shortages in the current winter. During the last few weeks of January, following the termination of the mandatory control program and the institution of voluntary price controls, several companies announced increases in prices for No. 2 heating oil. These increases were encouraged by the opinion of the outgoing OEP Director that the COLC guideline providing for price adjustments (in excess of certain other prescribed standards) "as necessary for efficient allocation of resources or to maintain adequate levels of supply," had the effect of lifting price controls on No. 2 fuel oil. However, the COLC reacted by setting the No. 2 fuel oil increases for public hearings beginning February 7, 1973. At the moment of writing, the impact of the new

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1/ Under the latest Executive Order, the COLC presently consists of -- in addition to the Secretary of the Treasury who serves as Chairman -- the Secretaries of Agriculture, Commerce, Labor, HEW and HUD, the Director of the Office of Management and Budget, the Chairman of the Council of Economic Advisers, the Director of OEP, the Special Assistant to the President for Consumer Affairs, and such other members as the President may designate from time to time. The Director of the COLC, appointed by the President, is also a member of the Council.

voluntary price control program on crude oil and oil product prices is, at best, unclear.

Executive Departments

At least seven departments within the Executive Branch affect some aspect of petroleum supply. Some -- such as Interior, State, Defense and Commerce -- obviously have a greater impact than others. Nevertheless, others can and do play a substantial role. Some of the more important functions of these departments relating to oil are identified below.[1/]

1. Department of the Interior

- The Office of Oil and Gas administers the oil import program.

- The Bureau of Land Management issues mineral leases (oil, gas and oil shale) for lands in the public domain, as provided for in the Mineral Leasing Act, the Acquired Lands Act and the Outer Continental Shelf Act.

- The Geological Survey regulates operating practices on federal oil, gas and oil shale leases; is responsible for, and evaluates the results of geological and geophysical exploration on OCS lands; collects royalties from mineral leases; and supervises the development of fuels and minerals under lease on Indian, OCS and other federal lands.

- The Bureau of Mines collects, analyzes and publishes technical and economic materials on petroleum production, trade and consumption; conducts basic research on oil shale and synthetic fuels; and disseminates

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1/ These functions are in addition to participation in oil policy formulation by the heads of the Interior, Commerce, State, Defense, Treasury and Justice Departments as members of the Oil Policy Committee.

information relevant to health and safety programs for the petroleum and gas industries.

- The Office of Coal Research conducts research directed toward developing processes for converting coal to clean forms of gaseous and liquid fuels, finding more efficient systems for generating electric power without pollution, and utilizing coal in conventional form without environmental damage.

- Office of Territories is responsible for territorial matters involving the Trust Territory of the Pacific Islands, Guam, American Samoa and the Virgin Islands. The Virgin Islands, the location of a 400,000 b/d refinery operated by Amerada-Hess, is presently a major source of low sulfur fuel oil. Guam has a 30,000 b/d refinery operated by Guam Refining Company.

2. Department of State

- The Office of Fuels and Energy is principally responsible for coordinating departmental activities and policies in all matters pertaining to petroleum and petroleum products. Also, Petroleum Attaches are maintained in the embassies of all major oil producing and consuming countries.

3. Department of Defense

The Department of Defense (DOD) is a major contributor to U.S. oil policy, a sizeable importer of foreign oils (over 60,000 b/d) and a major consumer of both domestic and foreign oils. (The military purchased over 750,000 b/d of petroleum products in 1972.)

- The Special Assistant for Petroleum Matters, Office of the Assistant Secretary for Installations and Logistics, acts as the principal

DOD advisor regarding programs, systems and procedures for making available petroleum products under conditions of peace and war.

- The Joint Chiefs of Staff monitor the requirements for petroleum products in relation to strategic and logistic plans, and also provide policy guidance for the Joint Petroleum Office.

- The Defense Fuel Supply Center (DFSC) within the Defense Supply Agency is responsible for the procurement of fuel, petroleum products and contracts for commercial petroleum services for the military and federal civil agencies; coordinates the movements of bulk petroleum by the Military Sealift Command with the needs of the military services; and maintains stocks of bonded fuel oil and jet fuel for use by the military in operations outside U.S. boundaries.

- Army Corps of Engineers is responsible for the design and construction of petroleum storage, distribution and dispensing systems at Army installations, and for water resources development activities, including river and harbor development and maintenance; also is involved in the proposed development of super-tanker ports within the U.S. and the expansion of oil transportation on the intercoastal waterways.

- Office of the Chief of Naval Operations provides logistic guidance for petroleum products for operating forces and shore establishments; coordinates participation in interagency petroleum programs; establishes war reserve levels of supply for the principal petroleum products; and maintains a tanker fleet to transport oil for all the services.

- Office of Naval Petroleum and Oil Shale Reserves maintains two sizeable oil reserves, one in Northern Alaska (Point Barrow) and the other

at Elk Hills, California. (The Elk Hills Field has been fully developed and is capable of producing over 100,000 b/d of crude oil.) The Navy also has a large shale oil reserve in western Colorado.

- U.S. Navy Fuel Supply Center administers the supply system for all petroleum products but does not maintain physical stocks of material.

- Headquarters, U.S. Air Force establishes policies to provide the Air Force with petroleum products, principally jet fuel. The Air Force is the predominant military user of petroleum, accounting for over 50% of all petroleum products purchased by the military.

4. Department of Commerce

- Office of Import Programs considers special problems involving industries affected by import competition.

- The Foreign Trade Zone Board (consisting of the Secretaries of the Treasury, Army and Commerce, with the Secretary of Commerce serving as Chairman) passes on the establishment of Foreign Trade Zones on U.S. soil in the interest of encouraging international trade.

- Petroleum and Coal Division of the Bureau of Domestic Commerce provides information to individuals, governmental agencies, and industry relative to petroleum production, manufacture and consumption in the interest of promoting U.S. industry and commerce.

- The Maritime Administration is responsible for the development, promotion and operation of the U.S. Flag Merchant Marine; organizing and directing emergency ship operations; and the granting of subsidies for the construction of tankers.

- National Oceanic and Atmospheric Administration establishes seaward boundaries in offshore lease areas when problems of jurisdiction occur.

- Office of Foreign Direct Investment administers a program which restricts the dollar outflow for direct investments abroad in order to help correct the balance of payments deficit.

5. Department of Justice

- Assistant Attorney General of the Civil Division handles all litigation in petroleum matters on behalf of the government.

- Assistant Attorney General in the Antitrust Division enforces the various statutes designed to prevent restraint of trade through monopoly or cartel and issues consent decrees for the merging of petroleum companies.

- Assistant Attorney General in the Land and Natural Resources Division establishes rights to mineral leases, and supervises suits to abate water and air pollution.

6. Department of the Treasury

- Bureau of Customs polices the implementation of oil allocation licenses issued by the Office of Oil and Gas (Department of the Interior) and enforces the Oil Pollution Act which prohibits the discharge of oil and refuse upon coastal waters.

7. Department of Transportation

- National Transportation Safety Board investigates accidents involving the transportation of petroleum or gas in pipelines or other modes of transport.

- The U.S. Coast Guard enforces the Oil Pollution Act of 1961 together with the Bureau of Customs, U.S. Treasury Department.

Independent Agencies

Finally, the supply of oil is affected directly or indirectly by several independent agencies, including:

- The Interstate Commerce Commission regulates common carriers engaged in various modes of surface transport, including oil pipelines and barges on inland waterways.

- The Export-Import Bank of the United States provides financing to facilitate the exchange of commodities such as crude oil and/or petroleum products between the U.S. and any foreign agency or individual.

- The Federal Power Commission regulates the natural gas industry, which indirectly affects fuel oil.

- The Environmental Protection Agency coordinates governmental efforts to abate and control pollution.

- The United States Tariff Commission provides advice in regard to, and administers, the tariff on crude oil and all other petroleum products except asphalt.

- The Federal Maritime Commission regulates water borne shipping in foreign and domestic offshore commerce; administers those provisions of the Water Quality Improvement Act of 1970 concerned with oil pollution; and polices the Merchant Marine Act of 1920 -- the so-called "Jones Act" -- which restricts foreign flag vessels from commerce on inland waters, as well as from coastal trade between U.S. ports, including the U.S. Territories and possessions. (A single exception pertains to trade with the Virgin Islands.)

II. MANDATORY OIL IMPORT PROGRAM

Over the years, the Mandatory Oil Import Program (MOIP) has undoubtedly had a greater effect on the supply of oil and fuel oil than any other Federal Government regulatory program. Moreover, for the future at least short term, increased imports under this program (or some other) appear to be the only available alternative for achieving any significant increase in supplies of low sulfur fuel oil. Therefore, a brief description of the MOIP is warranted here.

A. Establishment of MOIP

MOIP was established by Presidential Proclamation 3279, issued March 10, 1959. The Proclamation culminated a series of governmental actions looking toward the restriction of imports into the United States.

Beginning in 1954, the matter of crude oil and oil product imports became the subject of investigation by special committees and by the Office of Defense Mobilization (predecessor of the Office of Emergency Preparedness). Subsequently, the Director of ODM was required by Section 7 of the Trade Agreement Extension Act of 1955 to advise the President whenever the Director had "reason to believe that any article is being imported into the United States in such quantities as to threaten to impair the national security." Following the receipt of such advice, the President was authorized to make an investigation and, if necessary, to adjust the imports of such article to a level that would obviate the threat.

Various recommendations were made regarding limitation of oil imports, but no action was taken until the promulgation of a Voluntary Oil

Import Program in the second half of 1957. Established importers were asked to cut back crude oil imports to a level approximately 10% below their average imports over the period 1954-1956, with the objective of achieving an overall level of imports into the area east of the Rockies equivalent to approximately 12% of crude oil production in that area. After about a year, however, it became apparent that the Voluntary Program was not accomplishing the desired end, in part because (1) the only penalty for companies failing to comply with the program was loss of government contracts; and (2) imports of finished petroleum products, which were not in the program, rose precipitously, thus throwing the crude program out of balance.

On February 27, 1959, the Director of ODM reported to the President that crude oil and the principal crude oil derivatives and products were being imported in such quantities and under such circumstances as to threaten to impair the national security. A week later, a Special Committee to Investigate Crude Oil Imports recommended the imposition of mandatory controls on imports of crude oil and crude oil products (including liquefied petroleum gases, gasoline, kerosene, jet fuel, distillate fuel oil, lubricating oils, residual fuel oil and asphalt), together with specific maximum limits on the level of imports of crude oil, unfinished oils and finished products into states east of the Rockies (Districts I-IV), the West Coast (District V) and Puerto Rico.

Proclamation 3279 essentially ordered into effect the Special Committee's recommendations, including the proposed maximum import levels. The Secretary of Interior was directed to issue regulations creating a system for allocating authorized imports of crude oil, unfinished oils and

finished products. With respect to crude oil and unfinished oils, the Proclamation specified that allocations be made to companies with refinery capacity on the basis of refinery inputs during a particular period (except that initially no company having inputs during the base period would receive less than 80% of its last allocation under the Voluntary Oil Import Program), and that imported crude and unfinished oils must be processed in the licensee's refinery -- except that exchanges could be made for domestic crude or unfinished oils, again if processed in the licensee's refinery. As to finished products, the Proclamation provided that allocations be made to companies which imported such products during the respective base periods.

In addition, Proclamation 3279 established an Oil Import Appeals Board -- to be comprised of one representative each from the Departments of Interior, Commerce and Defense (the Defense representative was subsequently replaced by one from the Justice Department) -- with power, on the ground of hardship, error or other relevant special consideration, to (1) modify any allocation granted to any company, (2) grant allocations of crude oil and unfinished oils in special circumstances; and (3) review the revocation or suspension of any license.

The MOIP has been modified by the President 23 times in the 14 years since its inception. In addition, the implementing regulations of the Secretary of the Interior have been revised and amended some 70 times. In general, the modifications have provided for changes in the level of allowable imports; changes in the treatment of Canadian imports; the inclusion of "newcomers" and other new groups (such as petrochemical plants) in

the program; the grant of special allocations allegedly to promote the economic development of Puerto Rico and the Virgin Islands; the grant of special bonuses to promote the production of low sulfur fuel oil; and the relaxation or elimination of import restrictions on certain products (such as residual fuel oil imported into District I, asphalt and liquefied petroleum gases); and other changes. Some parts of the original program have been eliminated, such as historical allocations for crude oil and products (with some exceptions). In general, however, the principal overall procedures and regulations for determining allocations of imported oil have been retained.

In the past two years or more, several revisions have been made in the MOIP raising authorized import levels in recognition of potential shortages of crude oil and petroleum products. The latest Presidential Proclamation dated January 18, 1973 is especially significant in this regard. First, based on a finding by the OEP Director that increases in domestic production in 1973 will not be sufficient to supply demand for petroleum and petroleum products in that year, the President upped the level of allowable imports of crude, unfinished oils and finished products (excluding residual fuel oil) into Districts I-IV by over 50% -- from 1,785,000 b/d in 1972 (after all adjustments) to 2,700,000 b/d in 1973. Second, based on a finding of a threat of temporary shortage of No. 2 fuel oil, the President removed all restrictions on import of that product into Districts I-IV for the first four months of 1973. District V controls, since they set import levels at the difference between demand and domestic supply (which makes them self-adjusting) have not been changed.

The MOIP was subjected to a searching review a few years ago by a Cabinet Task Force on Oil Import Control, appointed by the President in March 1969. In February 1970, the Task Force issued a majority report recommending that the present import quota system be replaced over a transition period of three to five years with a tariff system giving preferences to Western Hemisphere sources and incorporating a "security adjustment" to protect against undue Eastern Hemisphere imports. This recommendation was not adopted by the President

At this time, the MOIP is now again under intensive review within the Administration. Major changes, or proposals for change, could be announced within the next one or two months.

B. Administration of MOIP

As noted previously, the policy direction of the MOIP is now provided by the Oil Policy Committee -- an interdepartmental group presently chaired by the Director of OEP. The day-to-day administration of the program is performed by the Office of Oil and Gas within the Department of Interior.

For purposes of applying the MOIP, the U.S. is divided into five districts, plus Puerto Rico. These districts, which correspond to the Petroleum Administration Districts (PADs) used in World War II, cover the following geographic regions:

District I - East Coast
District II - Midwest
District III - Gulf Coast
District IV - Rocky Mountain
District V - Pacific Coast (plus Arizona and Nevada)

In Districts I-IV, the only significant distinction in implementation of the MOIP relates to residual fuel oil which is practically exempt from import controls in District I (East Coast). In District V, quotas are determined on a different basis than in Districts I-IV. Puerto Rico is also treated separately.

Commodity-wise, the MOIP classifies petroleum imports in four categories: (1) crude oil; (2) unfinished oils (products imported for further processing, such as naphtha); (3) finished products (products imported for use without further processing, such as No. 2 home heating oil, jet fuel, gasoline, lubricating oils and asphalt); and (4) residual fuel oil to be used as fuel. In general, overall quota levels are established for the first three categories combined -- with unfinished oils generally limited to a specific percentage of the total and finished products generally limited to specified volume levels within these overall quotas -- and separately for residual fuel oil

In Districts I-IV, the level of imports of crude oil, unfinished oils and finished products (ex residual fuel) has been officially set at 12.2% of estimated domestic production of crude oil and natural gas liquids since 1962. However, this percentage figure has been exceeded by increasing margins in the past three years. In 1972, for example, total imports into Districts I-IV (excluding residual fuel oil) were ultimately fixed at 1,785,000 b/d after all adjustments during the year, representing over 17% of estimated domestic production. Including residual fuel oil increases the percentage to 35%.

In District V, the level of imports of offshore crude oil and unfinished oils is set at an amount which, together with domestic supply and production and exempt Canadian overland imports, will approximate total demand in that district. The licensed level of imports of crude and unfinished oils into District V in 1972 was 289,000 b/d. In addition, as explained later, 150,000 b/d of crude oil were set aside for granting "bonus" allocations of crude oil to persons in District V who produced low sulfur residual fuel oil.

Allocations of quota levels are handled differently for crude and unfinished oils, finished products, and residual fuel oil to be used as fuel. In the case of crude and unfinished oils, import licenses -- called "tickets" -- are issued in all areas (except Puerto Rico) to refining companies on the basis of refinery inputs and are calculated according to a "sliding scale" whereby decreasing percentages are assigned to higher increments of refinery runs of a company. This obviously favors the small refiners. All licensees are required to run (a) the imported crude oil in their own refineries, or, alternatively, (b) to import the oil and then exchange it for domestic oil which they must process in their own plants. The ability to exchange licenses or "tickets" results in virtually all imported crude oil being processed in coastal refineries, thereby avoiding the need for transportation of the imported crude to inland refineries. Thus, the exchange of "tickets" creates a certain value for inland refiners -- this value being roughly measured by the difference in price between foreign crude and domestic crude of approximately the same quality delivered to the same point. These values, however, are subject to negotiation where

the exchanges involve different qualities of crude and depending on the demand for foreign crude. Over the years, "ticket" values have ranged between zero and $1.50/bbl. Late in 1972, "tickets" were valued at about 50¢/bbl.

Beginning in 1966, allocations of crude oil and unfinished oils also have been made to eligible petrochemical companies on the basis of their petrochemical plant inputs. For 1972, the allocation was based on 11.2% of their plant inputs in Districts I-IV and 11.9% in District V. Petrochemical companies are permitted additional allocations based on amounts of petrochemical products exported to foreign lands.

In the case of finished products (other than residual fuel oil), allocations were originally granted in all areas to companies which were historical importers in a certain past period. Historical product allocations were eliminated in 1970 (except for the U.S. military) at which time a program was adopted for No. 2 oil imports into District I.

Special programs are followed for Puerto Rico and the Virgin Islands. In Puerto Rico, import allocations are granted to (1) historical refiners (those in operation in 1964) who are allowed imports to meet all local Puerto Rican demand, demand for export sales to foreign areas, and the volume of shipments made to the U.S. mainland in 1965; and (2) four companies (Phillips Petroleum, Sun Oil, Union Carbide and Commonwealth Oil & Refining) which, under special arrangements negotiated with the Secretary of the Interior in the mid-1960's, agreed to build petrochemical plants or refineries which would promote economic development in Puerto Rico, subject to access to Continental U.S. markets for a portion of plant output. As a result, the four companies were granted licenses to import crude oil from

Western Hemisphere sources into Puerto Rico and ten-year permits to move 64,000 b/d to the U.S. mainland of finished or unfinished oils (excluding residual fuel oil, which requires no permit for shipment to the Continental U.S.) in the Virgin Islands -- which lies outside U.S. customs territory so that a license is not required to import crude oil but is needed to ship products to the U.S. mainland -- the Interior Department in 1967 approved a special arrangement granting Hess Oil Co. (now Amerada-Hess Corp.) permission to ship 15,000 b/d of finished products (other than residual fuel oil) from its Virgin Islands refinery to Districts I-IV.[1/] As in the case of the Puerto Rico deals, this special allocation was justified primarily on economic development.

In addition, the Oil Import Appeals Board has the power to make special allocations on hardship grounds from so-called "set-aside" amounts granted to it from the total crude and products quota on grounds of hardship. OIAB allocations have become increasingly important in the past few years.

C. Treatment of Residual Fuel Oil Under MOIP

The subject of residual fuel oil[2/] is deserving of special mention because of its quite different treatment from that of other products under

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1/ On December 18, 1972, the President authorized additional shipments of No. 2 fuel oil and finished products from Puerto Rico and the Virgin Islands into Districts I-IV to help alleviate current fuel shortages.

2/ Residual fuel is a black viscous material primarily composed of the residuum (or bottoms) of the refining process. This residuum is suitable, within limits, for the firing of boilers in industry, electric utility plants, ship propulsion, and heating large buildings, etc. Residual fuel oil is not used for heating individual homes because small furnaces require a free flowing and clean distillate type of fuel oil.

MOIP, the present dependence of the East Coast on imports of this fuel, and the consequences of importing a finished product rather than crude oil.

Imports of residual fuel oil have increased over threefold in the past 14 years -- from about 500,000 b/d in 1958 to about 1,750,000 b/d in 1972 (nearly all of which is consumed on the East Coast). This increase is due to three principal factors. First, domestic production of residual fuel oil has declined as improvements in refining technology have permitted refiners to lower the proportion of residual output in favor of gasoline and other more profitable lighter products. Second, the MOIP was modified in 1966 to virtually decontrol imports of residual fuel oil (for use as fuel) into District I. The result has been to make the East Coast almost totally reliant on foreign imports for its residual fuel supply. Third, demand has risen because of air pollution regulations restricting sulfur content. The increasing dependence of the U.S. on imported residual fuel oil is as follows (from the U.S. Bureau of Mines, in millions of barrels daily):

	Domestic Production	Imports	Total Demand
1958	1.00	0.50	1.46
1959	0.95	0.61	1.54
1960	0.91	0.64	1.53
1961	0.86	0.66	1.50
1962	0.81	0.72	1.50
1963	0.76	0.75	1.48
1964	0.73	0.81	1.52
1965	0.74	0.94	1.61
1966	0.72	1.03	1.72
1967	0.76	1.09	1.79
1968	0.76	1.12	1.83
1969	0.73	1.27	1.98
1970	0.71	1.53	2.20
1971	0.75	1.58	2.30
1972	0.80	1.75	2.54

Sulfur content regulations have had a twofold effect from the standpoint of residual fuel oil supply. One has been to force Caribbean refiners -- which produce the bulk of the residual fuel oil imported into the United States -- to alter their operations in order to meet the sulfur requirements. Specifically, these refiners are now required to be more selective in their choice of crude oils (i.e., with respect to sulfur content, pour points and metals contained in the crude) used to manufacture low sulfur residual and, in many cases, they must also install elaborate and expensive systems for desulfurizing gas oil (distillate) for blending with the residual.[1/] While the amount of desulfurized gas oil to be blended depends on the sulfur content of the residual and the required sulfur content of the end product, as much as 50% gas oil may be required in the blend. The overall result is to reduce the quantities of No. 2 oil which could be made available by Caribbean refiners for importation into the U.S.

In addition, air pollution conditions and the ensuing sulfur regulations have led to various amendments to the MOIP designed to encourage imports of low sulfur residual fuel oil, or crude oil as bonuses for the production of low sulfur residual fuel oil. The first such amendment

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1/ For example, Venezuela -- currently the largest supplier of residual fuel oil to the U.S. -- produces crude oil with a sulfur content of some 2% to 3.5% and without desulfurizing, residual fuel oil with an even higher sulfur content. This is far above the requirements for East Coast residual fuel needs. Refineries could desulfurize Venezuelan residual fuel oil, but the cost would be almost prohibitive because of the high vanadium content of the Venezuelan residual. Thus, low sulfur residual fuel is made from Venezuelan crudes by desulfurizing distillate (gas oil) and blending it with the residual fuel, thereby producing a lower sulfur residual but with a lower viscosity. All low sulfur Venezuelan residual is being produced by this method.

occurred in October 1967 when the Secretary of Interior provided for bonus allocations of crude oil on a barrel-for-barrel basis to refiners in District V who manufactured low sulfur residual fuel oil (under 0.5% sulfur content), whether refined from domestic or imported crude oil, and delivered it to "customers required to burn such fuel in order to comply with local government regulations." Allocations under this bonus program have increased steadily; from an initial rate of 12,000 b/d in 1968, they are estimated to have totalled 150,000 b/d in 1972 and to reach 200,000 b/d in 1973.

Next, in December 1968, the Secretary of the Interior sought to promote the production of low sulfur residual fuel oil in Districts I-IV by authorizing additional allocations to refiners manufacturing low sulfur residual oil. However, unlike District V, the allocations were restricted to unfinished oils imported from Western Hemisphere sources and to persons who installed a desulfurization facility. This amendment to the regulations was indefinitely suspended five months later, although not before three companies were granted 10-year allocations (which were not suspended) in return for agreement to construct desulfurization facilities to produce low sulfur residual on the East Coast. Thus far, however, construction had not started on any of the facilities mainly because of inability to obtain suitable plant sites.

In Districts II-IV, environmental pressures led several electric utilities and oil companies to apply to the Oil Import Appeals Board in the past three years for special allocations of low sulfur residual fuel oil on "hardship" grounds. In 1970, the OIAB granted such allocations to

Commonwealth Edison Co. and Detroit Edison Co. -- representing the first major import allocations to utility companies -- and announced the availability of about 26,000 b/d for allocation in Districts II-IV during the succeeding year. In 1972, the OIAB was granted a "kitty" of some 40,000 b/d of residual fuel oil for allocation in Districts II-IV in cases of demonstrated hardship.

Still another measure designed to provide some flexibility in residual fuel oil markets was a proposal by the Secretary of Interior to permit the topping of imported crude oil for the purpose of producing burner fuel, subject to the proviso that all products of the topping process be utilized in the importer's own facilities. It was further proposed that importers in District I could obtain the imported oil from any source, while importers in Districts II-IV would be restricted to Canadian sources only. Adoption of this proposed regulation would have supplemented existing provisions authorizing the direct burning of crude oil by encouraging, in the interest of safety, the topping of imported crude prior to burning. However, most of the comments in response opposed the proposal because of, among other reasons, the lack of a procedure for utilizing the naphtha topping for production of synthetic gas. The proposal was not adopted.

D. Assessment of MOIP on Fuel Oil Supply

The overall impact of MOIP on crude oil and fuel oil supply is subject to considerable controversy. Over the years, MOIP -- in conjunction with state prorationing -- has clearly held domestic oil and most product prices well above world levels and has guaranteed a market for at least

part of any oil discovered. But whether this degree of price maintenance and market assurance has led to substantially greater supply of domestic oil has been widely debated -- for example, some say that the huge discoveries of oil on the North Slope of Alaska would not have been made were it not for MOIP. Others say the discoveries would have been made anyway even without MOIP because the potential was so great in that area. Undoubtedly, domestic production of oil is larger than it would have been without the program, but the added domestic output has not been without cost to the public.

With respect to fuel oil, MOIP has obviously not resulted in an adequate supply at the present time, especially on the East Coast but also in the Middle West and the Gulf Coast as well. This situation, however, is not entirely attributable to MOIP but stems from the complex interaction of a large number of factors including a rapid and mainly unanticipated increase in demand.

From the standpoint of national security, the District I residual fuel oil exemption has resulted in nearly total dependence on imported residual oil for the East Coast region. Another adverse consequence of this exemption has been to promote -- more than any other program encompassed in MOIP -- the exportation of U.S. refinery capacity. To a lesser degree, the special No. 2 fuel oil program (and the removal of import restrictions on LPGs from Western Hemisphere sources) has also contributed to this situation. While there appears to be no way of eliminating the need for imports to meet the petroleum needs of the U.S., the adverse security consequences of dependence upon imported oil could at least be

minimized through limiting imports to the extent possible to crude oil, thereby allowing refining operations to take place in the United States.

A collateral effect has undoubtedly been the discouragement and postponement of investment in promising long-run domestic energy sources, e.g., coal and nuclear power. Residual fuel oil is used by large consumers, e.g., utilities, industry and large space heaters, who frequently have sufficient capital resources to enable a choice between competing fuel sources. Thus, insofar as MOIP programs either exempt residual oil imports from quota levels or promote the domestic production of residual oil at low prices, these consumers will tend to avoid the investments necessary to use either coal or nuclear power in favor of residual oil.

This problem is compounded by environmental considerations, since the economics of low sulfur residual oil use are considerably more favorable at the present time than attempting to adapt to the use of coal with appropriate facilities to reduce harmful emissions. However, it should be recognized that, at least until 1975, there is really no practical alternative to the use of low sulfur residual oil in those regions where stringent pollution regulations are in effect.

A further major detriment of the MOIP is its adverse effect on balance of payments. While there is no way of avoiding this adverse effect, given the necessity of imports, the consequences can nevertheless be minimized by limiting imports, insofar as possible, to crude oil rather than higher cost products.

On the plus side, the various import measures relating to residual fuel oil (and No. 2 fuel oil) supply have unquestionably had a beneficial

effect on prices to consumers because of the lower cost of the foreign products. The District I residual fuel oil exemption has kept the price of this product at a considerably lower level than if imports had been restricted. The independent terminal operators and fuel distributors in District I maintain that even their limited access to imports of No. 2 fuel oil has had a beneficial effect on home heating oil prices on the East Coast, although this benefit has been eroded by recent substantial price increases on the part of the principal foreign suppliers of No. 2 fuel oil.

E. Alternatives to MOIP

The purpose of MOIP is primarily to support the domestic oil industry by limiting imports of foreign crude oil and products on a volumetric basis. This is not the only way to support a domestic industry. In general terms, there are at least four general approaches to supporting a domestic industry versus its foreign competition:

1. Volumetric limits on imports, such as MOIP.
2. Tariffs or fees on imports, such as recommended in 1970 by the U.S. Cabinet Task Force on Oil Import Control in 1970.
3. Methods which combine features of both of the above, such as import auctions proposed by at least one major oil company in the last few years.
4. Direct subsidy of the domestic industry.

The major advantages (as seen by proponents) and disadvantages (as seen by opponents) of each are as follows:

1. Volumetric Limitations

Advantages

1. Volumetric limitations can totally insulate domestic prices from downward pressure of lower foreign prices (on a delivered to the U.S. basis).
2. If administered properly, the minimum portion of the domestic market available to the domestic industry can be delineated and predicted. MOIP has not, obviously, had this advantage.
3. Once properly set up, minimal "fine tuning" adjustment or revision is required. Again, MOIP did not have this advantage because of its specific structure.
4. Planning by industry and government is probably easiest with this approach, at least in theory, because each company should know well in advance exactly what import volume he will get.
5. Cost of imports to the importer (not necessarily the consumer) is minimized, i.e., nothing is added in duty or fee.

Disadvantages

1. Does not generate revenue in basic form.
2. It is complex in structure, because import volumes have to be allocated in some fashion to all of the recipients and a balance between crude and product imports must be determined.
3. There is usually no price competition between domestic and foreign crude and products.
4. When domestic supply is inadequate, a revision in quota levels is required.

5. The program generates pressure for added low cost imports, which is a disincentive for developing domestic oil operations.

2. Tariff or Fee Approach

Advantages

1. Allows maximum interplay of market forces, i.e., who buys what from whom at what price is only minimally restricted. Also, there is some price competition between domestic and foreign crude and products.
2. Feueral revenues are generated, which if domestic versus foreign price differential is large can be very large.
3. In basic form, the structure can be very simple conceptually.
4. The most generally used method of restricting imports is through tariffs.

Disadvantages

1. Import volumes are quite unpredictable, therefore, portions of the domestic market available to the domestic producer are unpredictable.
2. Price of domestic crude can be quite volatile, depending on vagaries of tanker rates and foreign oil prices, reducing the incentive to develop new domestic reserves. Even careful "fine tuning" may not avoid this problem.
3. Cost of imports to the importer are increased. The consumer may or may not know the difference in cost.

3. Combination Approaches

The major combination approach proposed in recent years has been the import auction, and advantages and disadvantages of this are

discussed here. In the import auction system, the desired volumes of imports are periodically auctioned by the government to the highest bidders. It is largely a volumetric approach -- total import volume is limited, and there is also what could be called a variable tariff or fee according to how high the bidding goes.

Advantages and Disadvantages

This approach has all the advantages of the volumetric, except that each company does not know what imports he will get until after each auction. Also, revenues are generated which means cost of imports are not minimized.

It also has the unique disadvantage of favoring the cheapest foreign product(s) over all others.

4. Direct Subsidy

This is much like the tariff or fee approach, except instead of tacking on a tariff or fee to imports, a roughly equivalent per unit subsidy is tacked on to domestic products. Obviously, this approach can be a heavy drain on federal funds, but these are returned to the public in lower prices. Politically, this is probably the worst approach because funds required can be so large.

Which of the above is the best approach has been the topic of much debate and controversy. Whether any type of import restrictions at all are desirable is perhaps the most controversial issue, and that question is beyond the scope of this study.

As to the more specific concern of this study -- availability of clean fuel -- either the volumetric or the tariff/fee approach can be

structured so as not to restrict clean fuel or raw material imports short term during periods when domestic refining capacity is not adequate or cannot be completed in time. Also, either can be structured long term so as to encourage domestic refining of clean fuels, and to encourage more domestic raw material for clean fuels. More specifically, a volumetric approach can be set up to increase allowed volumes of crude or product short term as needed, and have firm volume limits longer term to encourage domestic production and refining. The firm limits can be phased in over a period of years to provide as smooth a transition as possible. Similarly, a tariff/fee approach can have minimal or no fees on crude oil and on products needed short term, and rise over a period of time to predetermined levels which will encourage domestic production and refining over foreign.

Regardless of the approach, it should be reviewed frequently, i.e., more than once a year, to see if its low sulfur fuel oil and other objectives are being met.

III. REGULATORY MEANS OF INCREASING LOW SULFUR FUEL SUPPLY

The regulatory means of increasing low sulfur fuel oil supply are reviewed below in two general categories: measures which could increase crude oil supply, and measures which could encourage manufacture of low sulfur fuel. As will be discussed, the options differ for the short and longer terms.

Before proceeding with this analysis, a brief review of the possible order of magnitude of the foreign contribution to the U.S. total supply of oil in the next ten to thirteen years may serve to lend some perspective.

Numerous projections of U.S. demand for oil and sources of supply have been advanced in recent years. With respect to demand, the projections differ according to assumptions made as to the rate and timing of nuclear power development, the extent of future coal usage and numerous economic growth factors. In regard to supply, the variables include, among others, the rate of increase (or decrease) in domestic drilling, the availability and timing of Alaskan North Slope oil reserves, the rate of offshore leasing, the rate of development of supplemental sources of oil supply from domestic oil shale and coal resources, and price and economic considerations. Variations in assumptions as to these factors make a considerable difference in the projected results. Nevertheless, a salient feature of all the projections is an increasing dependence of the U.S. on foreign sources of supply to meet estimated petroleum demand.

Recent projections by the National Petroleum Council illustrate this point. In a report released in December 1972,[1/] the NPC presented

1/ National Petroleum Council, "U.S. Energy Outlook," December 1972.

four different studies of U.S. oil supply-demand balances to 1985. The most optimistic study -- in terms of the greatest availability percentage-wise of domestic supply -- showed U.S. dependence on foreign imports rising to 41% in 1975, but thereafter declining to about 30% in 1980 and 18% in 1985. These projections, however, seem highly unlikely considering the underlying assumptions: an increase of 5.5% annually in domestic oil and gas drilling activity, finding rates for domestic oil and gas discoveries approximately 50% higher than in the recent past, all new base load generating plants between now and 1985 will be nuclear, an increase of 5% annually in coal production for domestic consumption, and development and production of synthetic fuels at the maximum possible physical rate with no environmental or economic restrictions.

NPC's most pessimistic projection -- in terms of least proportion of domestic supply to total supply -- indicates U.S. dependence on foreign imports rising from about 23% in the early 1970's to about 65% in 1980 and 1985. This projection assumes continuation of recent adverse trends in the development of domestic energy sources, including a further decline in domestic oil and gas drilling, the same or lower finding rates than those experienced in the past, continued siting and licensing problems with respect to nuclear plants, no improvement in incentives to develop new coal mines, and continued environmental constraints retarding development of new resources.

Intermediate projections of NPC -- reflecting assumptions between those underlying its most optimistic and least optimistic studies -- show U.S. dependence on foreign imports ranging between 42% and 46% of total

projected oil supply in 1975 and between 38% and 52% in 1985. These results probably represent a realistic range of projections -- at least insofar as such projections can be made at this point of time.

Notwithstanding their differences, the implication of the NPC projections -- and numerous others as well -- is that the U.S. must strive to develop adequate additional domestic supply in order to keep dependence on foreign oil from rising too far above present levels. Otherwise, the combination of rapidly rising foreign imports and the likelihood of continually rising foreign oil prices threatens severe consequences from the standpoint of national security and balance of payments. The amount we will be paying for foreign oil unless we change our course becomes very large, even in just a few years, and the balance of payments outflow which results is enormous. (James Akins, U.S. State Department, in testimony before the Senate Commerce Committee, October 1972, estimates at least $10 billion per year by 1980 if we do not change our course.)

Moreover, since there is a long lag time in most measures which would achieve adequate domestic supply, and since we have not yet changed our course, there is likely to be a period in the late 1970's when we do not have enough domestic energy, and may not be able to afford the balance of payments outflow of importing enough energy (mainly as oil) to meet projected needs. This is, in our view, what will ultimately limit low sulfur fuel oil supply (as well as supply of all petroleum products) later in the 1970's. This is also a major reason why we emphasize domestic crude oil supply in the discussion which follows.

A. Regulatory Means of Increasing Crude Oil Supply

1. Increasing Domestic Crude Oil Supply

There are relatively few purely regulatory options for increasing future domestic crude oil supply. The most significant are first, accelerated leasing, and second, letting prices rise under Phase III, both while continuing to limit imports under MOIP.

Accelerating and regularizing the leasing of offshore lands is one of the more obvious ways to increase domestic crude oil supply. Only about 1% of federal offshore area has been leased. For comparison, about 20-25% of this area is estimated to have favorable oil prospects. Moreover, the U.S. Continental Shelf out to a depth of 200 meters can be drilled with technology now at hand.

Oil and gas lease sales in the 1960's were sporadic, with the result that promising drilling prospects for the industry did not become available as fast as they might have with a more regular schedule. The response of the industry to those sales which were held gives every indication that additional leasing would have been as favorably received. For example, in every general lease sale held by the Interior Department beginning in 1967, total bonus bids to the U.S. Government exceeded $500 million, with the last in December of 1972 bringing an all time record of nearly $1.7 billion.

The Gulf of Mexico is the logical focal point of the Department of Interior's current leasing plan because of large potential crude oil (and gas) reserves. Offshore Louisiana is already a prolific producing area; offshore Texas has shown less promise to date, although significant potential is believed to exist.

From the standpoint of location, the Atlantic OCS is an obvious source of providing substantial supply increases of both oil and gas for the East Coast, already heavily dependent on imports of foreign oil and likely to become also dependent on imports of foreign gas (LNG) in the future. While East Coast states will benefit from the development of potential reserves in the Gulf of Mexico, they must share that potential with other areas of the country which rely on Gulf Coast sources. By contrast, all of the Atlantic OCS potential would presumably be available for local East Coast markets.

Though not as strategically located, the potential of the Gulf of Alaska could also be very large.

In offshore California, leasing was halted by the major oil spill occurring in January 1969, and further drilling on some 35 leases granted prior to that time has been suspended. Interior's authority to order suspension of operations is now in the courts. Thus, the situation is uncertain in California at the moment. However, the same basic considerations dictating the leasing of Atlantic OCS lands also favor a resumption of leasing of the California OCS and extension of this leasing, assuming sufficient industry interest and favorable geological data, to other Pacific Coast offshore areas.

A corollary issue connected with offshore leasing concerns the leasing method which will best promote early and rapid exploration and development of the OCS lands. Interior's present method of awarding leases is through cash bonus bidding, with a fixed royalty (16-2/3%) required on any ensuing production. This method has been criticized on the ground that

it siphons off large amounts of capital in bonuses which might otherwise be expended on exploration and development. Another criticism is that the bidding process is restricted to larger operators able to afford the cash bonus plus finance subsequent drilling activities, thereby discouraging by smaller operators with less financial resources.[1/] This is said to deter the widest possible participation in offshore development. Alternative methods have been suggested, the two principal ones being: (1) a deferred bonus-fixed royalty system under which portions of the bonus would be due at various times in the future; and (2) a royalty bidding system, with no bonuses.

Both of the suggested alternatives could make available large sums of capital for exploration and development that otherwise would be committed to bonus payments. Thus far, however, Interior has taken the position that these methods would result in less incentive for full lease development and recovery of resources.[2/]

Letting crude oil prices run free under Phase III (or its successor), while continuing to limit imports under MOIP, would certainly result in greater supply of conventional crude oil. And, if prices ran far enough, to say over $5/bbl (in 1973 dollars), supplemental (synthetic) oil would likely become economic. The amount of new conventional oil that

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1/ The present method has not precluded smaller operators from participating in offshore leasing and exploration in joint ventures with other companies.

2/ In testimony before the Senate Interior Committee on June 19, 1972, then Assistant Secretary of the Interior Harrison Loesch defended the present cash bonus bid-fixed royalty system as the best of the possible alternatives and said Interior does not currently plan to change this system unless directed to do so by Congress.

would be found at higher prices is impossible to quantify, but is certainly substantial.

The potential amount of supplemental domestic oil, mainly from shale or coal, is almost unlimited by shale or coal supply. However, environmental problems may represent a limiting factor on both coal and shale, as well as the availability of water (needed to process shale oil) in the case of shale. Supplemental oil supplies ultimately will have to play a major role in our energy picture, and much research and attention has been given this subject. We will not labor this complex supply alternative here, however, because the massive subsidies or other special incentives needed to develop supplemental oil (barring raising crude oil prices) can only come from legislative action.

Other regulatory means of increasing domestic oil supply include granting import quota "tickets" under MOIP to those who find new oil and to those who produce otherwise uneconomic oil. This approach has been promoted, especially by independent producers, at various times in the past. Potential would be limited both by availability of tickets, and by the uncertainty in future ticket values.

2. Increasing Foreign Crude Oil Supply

Short term, there is probably no alternative to higher import quotas under MOIP for increasing foreign crude oil supply.

Longer term, other than Canada and possibly selected other Western Hemisphere countries, we do not recommend regulatory measures to increase foreign oil supply. The option of letting prices run up under Phase III

or its successor, and then granting Canada special preference under MOIP, would encourage both conventional and supplemental oil (from tar sands) from that country.

B. Regulatory Means of Increasing Low Sulfur Fuel Manufacture

1. Increasing Domestic Manufacture of Low Sulfur Fuel Oil

An obvious regulatory option for increasing domestic manufacture of low sulfur fuel oil (and naphtha) would be to either hold all residual fuel oil imports at present levels, or to scale down such imports over a period of time under MOIP. Concurrently, domestic fuel oil prices (and naphtha) would have to be permitted to rise under Phase III (or its successor) enough to make domestic manufacture attractive, and crude oil imports would have to be increased, at least in the short term.

There are a variety of other options that have been studied and/or proposed to specifically encourage domestic manufacture of fuel oil (and naphtha). Most involve using "ticket" values under MOIP in some way as an incentive to make fuel oil or naphtha domestically.[1/] The two most

1/ The future trend in "ticket" values -- measured roughly by the difference in the relative price of U.S. and foreign oil of comparable quality at the same point -- will be an important factor in determining the effectiveness of some of the options for increasing supply of low sulfur fuel oil. "Ticket" values are now about $0.50/bbl, substantially lower than they were a few years ago partly because of a fairly rapid rise in foreign oil prices compared with only a modest rise in domestic prices. Although there is disagreement on this subject, we expect foreign oil prices to continue to rise rapidly over the next decade. This means that if the present slow trend of increase in domestic oil prices continues, foreign and domestic prices will converge in just a few years, and ticket values will be nil. On the other hand, if imports continue to be restrained under MOIP, there is no supply and demand reason why domestic oil prices cannot maintain a substantial spread over foreign, which would mean a substantial ticket value. On the other hand, because of inflationary pressures or for political reasons, the government may not permit a spread to continue or could even go so far as to keep domestic prices below foreign. In sum, the future value of import tickets can only be considered as quite uncertain at this time.

important are extending the "bonus" approach now in effect in District V to the rest of the country, and the so-called "drawback" approach. The first simply grants import tickets for manufacture of low sulfur fuel oil on a one barrel for one barrel ratio. Thus, the ticket value is a direct subsidy for making low sulfur fuel, regardless of what it is made from.

The "drawback" approach, on the other hand, is an attempt to give some of the advantage now accruing to foreign refiners to domestic refiners as well. In this option, the refiner is granted import tickets in direct proportion to the amount of unrestricted products (under MOIP) he makes from foreign oil. Thus, if a refiner makes 20 barrels of residual fuel oil and 10 barrels of naphtha for synthetic natural gas feedstock from 100 barrels of foreign crude, he will receive tickets for 30 barrels more foreign oil. This approach is not as favorable to low sulfur fuel manufacture as the bonus plan, but it does encourage domestic fuel manufacture as well as domestic refining.

Another type of proposal is the so-called ICOP (Imported Crude Oil Processing) plan which contemplates the processing of imported oil in a simple, separate refinery into residual fuel oil, synthetic gas, or other products not subject to import restrictions. There does not appear to be much interest in this approach now, presumably because building separate refineries of this type is a less efficient allocation of resources than integrated additions to existing refineries such as would occur with the "drawback" plan.

Another option is desulfurizing of imported high sulfur unfinished heavy oil, which could be encouraged under MOIP and Phase III. This

has the disadvantage that, in general, balance of payments outflow from importing an unfinished product, i.e., a partially refined product, is greater than importing crude oil, though less than importing a finished product.

It would certainly be desirable to encourage domestic refining by restraining environmentalist and other opposition to refineries and superports, especially on the Atlantic Coast. However, purely regulatory measures would not seem to contribute much here -- this is a complex mixture of political, legislative, regulatory, and judicial problems largely at the state and local rather than the federal level.

2. Increasing Foreign Manufacture of Low Sulfur Fuel Oil

Short term, there may be no choice but to permit imports of low sulfur fuels.

Longer term, as in the case of foreign crude oil, we do not recommend measures to encourage foreign manufacture of low sulfur fuel, although again, Canada and possibly other Western Hemisphere sources may be exceptions. Here, Canada, etc. could get special preference in MOIP, with fuel oil prices in the U.S. permitted to run up under Phase III (or its successor) to levels sufficient to encourage Canadian manufacture and export to the U.S.

C. Legislative Means of Increasing Crude and Fuel Supply

Present regulatory means of increasing low sulfur fuel oil supply are extremely limited, so new legislation may be needed to increase crude and fuel oil supply. Possible legislative measures fall into two broad categories -- new incentives to increase domestic oil production and refining, and new measures to reduce consumption of oil and its products.

Broadly, legislative incentives to increase domestic crude oil production (beyond what can be achieved within the regulatory framework of oil import policy and price controls) fall within three basic groups -- new tax incentives, direct subsidy of or participation in oil operations, and R&D support. We think the first and third can be effective and are the most palatable politically, providing one adds the qualification on the first that tax incentives apply only to "new" (in contrast to already discovered or "old") oil or to developing of oil supply not otherwise economic, such as higher cost secondary or tertiary recovery oil. In our opinion, the outlook for legislation which applies new tax incentives to "old" oil in addition to "new" oil is rather dim, because this would contribute to inflation, and in the view of some, unfairly enrich the owners of reserves already found. Across the board incentives may be more palatable <u>if</u> the incremental profit accruing to holders of "old" oil reserves were required to be reinvested in exploration.

Tax incentives to increase domestic exploration and production could take various forms, from increasing the depletion allowance to an investment tax credit on exploration expenditures. Increasing domestic production in response to such incentives would almost directly increase low sulfur crude oil availability, because the bulk of domestic oil found in the past has been of low sulfur (sweet) variety).

Direct subsidies or federal participation in exploration, to be effective, would place heavy drains on the Treasury, hence we do not see these as really viable options. R&D support, though it may be somewhat costly, has obvious advantages in such areas as developing supplemental

oil supply (from shale or coal), improving offshore and deep well drilling technology, and improving secondary recovery technology.

Incentives that increase domestic refining could tend to increase low sulfur fuel oil availability, if incentives are structured to particularly encourage making clean fuel oils rather than just to encourage domestic refining in general. Types of legislative incentives that can be applied to encourage domestic refining are fast tax writeoff, investment tax credits, reduced income tax on domestic refining or direct domestic refining subsidies.

The measures indicated above would not tend to discourage short term importing of low sulfur fuel oil or raw materials. Thus, they do not have the problem discussed for import policy where it is difficult to reconcile the long term objective of increasing domestic supply with the short term need for imported supply. In the long term, these measures will increase domestic supply and enable us to reduce imports. In addition to these measures, a tariff or fee on imports may be needed to insure that domestic supply so developed will be used by the consumer.

Legislative measures to reduce consumption of other petroleum products, which would make more oil available for conversion to low sulfur fuel, cover a wide range of possibilities. We do not think rationing is a reasonable alternative longer term. On the other hand, such things as promoting mass transit and requiring better insulation on houses appear desirable and have other important benefits. Ultimately, substantial selective fuel taxes to reduce consumption will probably be needed. Such taxes have the political advantage of generating much needed revenues, but have the major political disadvantages of being unpopular (barring a much more severe energy crisis) and of affecting the less affluent disproportionately.

IV. OPTIMAL REGULATORY STRATEGIES TO INCREASE LOW SULFUR FUEL SUPPLY

A. Short Term

Short term (to about the end of 1975), we think the optimal regulatory changes which would tend to increase supply of low sulfur fuel oil are:

1. Raise domestic low sulfur fuel oil ceiling price permitted under Phase III to encourage domestic manufacture of low sulfur fuel oil (Phase III does not control price of imports).

2. Adopt a "bonus" and/or "drawback" plan under MOIP to encourage domestic manufacture of low sulfur fuel oil in Districts I-IV.

3. Remove import restrictions on low sulfur fuel oil in Districts II-V under MOIP.

4. Offer import ticket bonuses under MOIP for newly discovered domestic crude oil and for domestic crude oil which would otherwise be uneconomic to produce.

The amount of low sulfur fuel oil which would be immediately forthcoming with these measures is likely to be small -- while their effect would be to encourage optimum use (in terms of fuel oil) of desulfurization and existing refining capacity, desulfurization capacity is limited both in the U.S. and abroad. The amount of domestic crude oil those measures would bring out immediately would also likely be small, although some high cost oil might be shut in now that such measures would make profitable.

The additional domestic low sulfur fuel oil generated by these measures in a year or two may again be small, though imports into Districts II-V might become significant. The effect of those measures depending on

ticket bonuses is likely to be small due to the uncertainty in future ticket values; refining and particularly desulfurization equipment is very costly and is unlikely to be added unless incentives can be expected to last for some time. Also, because of the time lag between looking for oil and producing it, ticket values which are uncertain longer term may not offer much new incentive to look. Letting prices rise is probably less uncertain, but refiners have been faced with so much uncertainty in so many phases of their business that they may be reluctant to invest any large sums they can avoid. In addition, special incentives for low sulfur fuel oil could reduce supply of other petroleum products now in short supply. Legislation assuring refiners of incentives, whether price or otherwise, would probably change this view, but that is not a regulatory option.

Of course, the regulatory agencies involved would be the Cost of Living Council for higher prices, and the Oil Policy Committee for the rest.

The cost to the consumer of letting low sulfur fuel oil prices rise would probably be moderate if the amount of the increase were not excessive. The cost could be substantial, however, if such increase acted to pull up the price of imported fuel oil.

The cost of removing import restrictions may be increased balance of payments deficits, but short term this may be tolerable.

B. Longer Term

Longer term (from about 1976 on), we think the optimal regulatory changes which would tend to increase supply of low sulfur fuel oil include all the short-term measures except removing import restrictions (item 3), plus the following:

1. Accelerate offshore leasing.

2. Limit or reduce imports of low sulfur fuel oil, but on a specified, long-term phased in basis.

Accelerating federal offshore oil (and gas) property leasing will increase crude and potential fuel oil supply, and probably at relatively low cost compared with other domestic options. Also, substantial federal revenues are generated. The main cost involved is environmental, although strict regulation should keep this cost low in the Gulf. The environmental cost of leasing offshore in the Atlantic and in the Gulf of Alaska, where there has not been the background of experience as in the Gulf, may be higher, although it would seem that strict regulation and care in choice of areas to be leased should keep this cost reasonable compared to benefits. Leasing is relatively slow to increase crude oil supply. It takes several years to find and develop a new field, and then reserves so discovered are produced over a long time frame of 10, 20 or more years.

The benefit of limiting or reducing imports of low sulfur oil longer term lies in improving balance of payments and security factors. Also, there is a relative benefit here from importing oil as crude than as a finished product.

As in the short term, using import tickets as incentives to increase low sulfur fuel oil manufacture and to increase crude oil reserves may also not be very successful longer term due to uncertainty as to longer term ticket values.

We did not include letting crude oil prices rise substantially under Phase III or its successor as an optimal regulatory strategy, because

this option does not appear to be politically viable. Letting crude oil prices rise across the board, compared to specific incentives for newly discovered oil or oil that would not otherwise be economic, does not appear consistent with solving the currently critical problem of inflation. A specific, controlled increase in price of a single product such as low sulfur fuel oil which is needed to meet pollution control objectives is not in the same category. Given the likelihood of strong inflationary pressures in the U.S. for the foreseeable future, it is hard at this time to see any Administration permitting large increases in domestic crude oil prices across the board.

Barring a large domestic crude price increase, the quantity of low sulfur fuel oil generated longer term by all of the regulatory measures above will likely be limited by availability of domestic crude oil, and availability of domestic crude oil will not be much affected by these measures. As discussed earlier, if we do not alter our present course on domestic oil, and this is, in our view, mainly a legislative matter, the availability of low sulfur or any other fuel oil may be very limited indeed later in this decade.

C. What EPA Can Do

From the above, it appears that the regulatory options for increasing low sulfur fuel oil supply are very limited. In our view, it is mainly up to Congress to provide the incentives and the stable investment climate to develop the domestic oil base needed to assure availability of low sulfur fuel oil.

Nevertheless, we think EPA can make a significant contribution to increasing low sulfur fuel oil supply long term by doing the following:

1. Encourage and support legislation now which will eventually increase domestic oil supply. Optimal legislation from the standpoint of both developing low sulfur fuel supply and political palatability would seem to be selective new incentives (a) to develop new or otherwise uneconomic oil and (b) to develop supplemental oil supply from shale and/or coal.

2. Use the influence of EPA as an independent agency to publicize the environmental tradeoffs involved in running short of low sulfur fuel oil versus increasing domestic oil supply. EPA is in a better position than any other agency or group to convince the public that if we do not accept some environmental risk from say offshore drilling, we may face greater and more certain environmental damage from not having low sulfur fuel oil.

3. Use the influence of EPA to try to achieve the goals of environmentalist groups with minimal court or other delay of domestic oil projects. This might take various forms, such as acting as an intermediary, helping other agencies write environmental impact statements, or encouraging controls stiff enough to avoid environmentalist intervention but not so stiff as to kill important energy projects.

4. Use the influence of EPA to tell the story of environmental consequences of domestic energy measures in a balanced and level headed manner, rather than letting the extremists and alarmists of the environmental movement dominate the scene.